REMARKS

A two month extension for response and the $420.00 fee are being supplied herewith.

The specification has been amended in pages 1 and 8 to properly a referenced application.

Claims 1, 17, 26 and 42 have been amended. Claims 3, 19, 28 and 44 have been canceled. Claims 1, 2, 4-18, 20-27, 29-43 and 44-50 remain in this application.

The Examiner has rejected claims 1-50 under 35 U.S.C. 103(a) as being unpatentable over United States patent 4,989,090 issued to J. J. Campbell et al. on January 19, 1991 (Campbell) in view of United States patent 5,699,499 issued to R. Kawada et al. on December 16, 1997.

It is respectfully submitted that the amendments to claims 1, 17, 26 and 42 , in addition to recited elements in the original claims have made the Examiner's grounds for rejection mode.

At the outset it is felt best to high-light some of the differences between applicants' invention as recited in the claims and the apparatus of Campbell and Kawada.

Applicants invention is a so-called motion adaptive arrangement. This is because applicants detect whether there is motion or not in the video by using motion metric values. If the video is determined to be moving, applicants use field based interpolation to calculate the missing pixel values, and if the video is determined to be still, applicants use frame-based interpolation to calculate the missing pixel values (hence it is called motion adaptive). So applicants use either field-based interpolation or the frame-based interpolation to calculate the missing pixels, depending on the values of motion metric.

It is noted that neither Campbell nor Kawada disclose any such use of motion metrics.

Indeed, both Campbell and Kawada use motion estimates. The motion estimate uses "motion vectors" to calculate missing pixel values. The missing pixel values are calculated by estimating where an object is moving to. Therefore, the missing pixel values may be either field-based or frame-based. This method may produce better results than "motion adaptive", but it is more complex to implement, and when things go wrong, the method may produce more noticeable artifacts.

Even if the apparatus of Kawada were combined with the Campbell apparatus it is respectfully submitted that the combination still not result in applicants' unique invent as now defined in the claims.

In fact, there is an important difference between Kawada's median filter and applicants spatial median filter.

Applicants' median filter applies to the motion metric value. It doesn't apply to the pixel values as the Kawada median filter does. Applicants always use either the field-based, or frame-based interpolation to calculate motion metric values. That is, applicants' median filter doesn't apply to the calculation of pixel values.

In Kawada's apparatus, the pixel values are calculated using motion vectors, and the median filter is applied to the PIXEL VALUES.

Even if Kawada's were combined with Campbell, their median filter still applies to the pixel values, rather than motion metric.

Nowhere in Kawada do they specifically say spatial medium filter. What they seem to be doing is using motion estimates, which they take the medium of.

Again, Kawada's calculation may result in a few pixel values, and they take the median of those pixel values as the pixel value for the missing pixel. The disadvantages of this method are that when the median pixel value is wrong, it produces very noticeable artifacts, because the pixel value is directly displayed.

Applicants invention is safer. Applicants do not choose the median of the pixel values. Applicants apply the median filter only to the motion values. Applicants do not apply the median filter directly to the pixel values. If a motion value is wrongly chosen, it only affects the choice of frame-based or field-based interpolation. If such a choice is wrong, it won't produce artifacts as bad as Kawada's when they are wrong. This is because either frame-based or field-based interpolation would give a good pixel value for the missing pixel (of course one of them is better, that is why we use the motion metric values to select the better one).

In light of the above discussion it is believed that currently amended claims 1, 17, 26 and 42 are allowable over the rejection under 35 U.S.C. 103(a) based on the Campbell and Kawada patents.

Specifically, claim 1 as currently amended recites:

"Apparatus for use in a video image de-interlacer comprising:

a frame interpolator for yielding a frame based luminance value for a missing pixel by using frame based interpolation;

a field interpolator for yielding a field based luminance value for a missing pixel by using field based interpolation;

a luminance difference unit for obtaining luminance value differences of pixels in prescribed fields of an image in accordance with prescribed criteria;

a motion detector supplied with prescribed ones of said luminance value differences for generating a motion metric value at a missing pixel and for filtering said pixel differences to remove aliases under predetermined motion conditions;

a spatial median filter supplied with at least three of said motion metric values for determining a median motion metric value and for removing random noise from said luminance differences without creating spurious motion values; and

a controllable combiner supplied with said frame based luminance value and said field based luminance value and being responsive to a representation of said median motion metric value to controllably supply as an output a luminance value for said missing pixel,

wherein said controllable combiner, in response to said representation of said median motion metric value indicating the image is still, outputs said frame based luminance value and, in response to said representation of said median motion metric value indicating motion in the image, outputs said field based luminance value."

Surely neither Campbell nor Kawada, taken alone or in combination or in combination with any other know reference shows, teaches or suggests applicants' unique invention as now recited in claim 1. Consequently, it is submitted that claim 1, as currently amended is allowable under 35 U.S.C. 103(a).

Claims 17, 26 and 42 are independent claims which have been amended to correspond to claim 1, as currently amended. They too include similar elements or steps